

Cited Reference 3

PATENT ABSTRACTS OF JAPAN

(11)Publication number : 2000-301372

(43)Date of publication of application : 31.10.2000

(51)Int.Cl.

B23K 26/00
 B23K 26/06
 B23K 26/18
 C03B 33/02
 C03C 23/00
 G02B 5/30
 H01S 3/11
 // B41J 2/135

(21)Application number : 11-116767

(71)Applicant : SEIKO EPSON CORP

(22)Date of filing : 23.04.1999

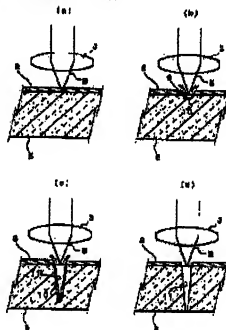
(72)Inventor : UMETSU KAZUNARI

(54) LASER BEAM MACHINING METHOD FOR TRANSPARENT MATERIAL

(57)Abstract:

PROBLEM TO BE SOLVED: To provide a laser beam machining method for transparent material which is practical in industrial use and capable of forming a fine deep hole speedily, inexpensively with high quality and high precision on a transparent material such as various glasses by a low output laser beam.

SOLUTION: A pigment 8 is stuck on a glass substrate 6 surface in an uniform thickness, the surface is irradiated with a Q switch pulse oscillation YAG laser beam B of a single mode consisting of a basic wave, a second harmonic wave or a third harmonic wave. The pigment absorbs laser energy of a first one or more of pulses, a plasma state of high temp/high pressure is generated on the glass substrate surface, a surface layer glass is fused/removed to form a recessed part 9, further, its surrounding is modified to a composition liable to absorb a beam. The modified layer 10 absorbs subsequently irradiating laser beams to be fused/removed, thus, a fine hole 11 piercing the glass substrate is formed.



LEGAL STATUS

[Date of request for examination]

[Date of sending the examiner's decision of rejection]

[Kind of final disposal of application other than the examiner's decision of rejection or application converted registration]

[Date of final disposal for application]

[Patent number]

[Date of registration]

[Number of appeal against examiner's decision
of rejection]

[Date of requesting appeal against examiner's
decision of rejection]

[Date of extinction of right]